

**HIGH PRESSURE FORMING EQUIPMENT
FOR DECORATIVE AND/OR FUNCTIONAL
AUTOMOTIVE (INTERIOR/EXTERIOR) PARTS
WITH TOOLING DESIGN FOR INJECTION MOLDING**

- **What are the current challenges for our technology? SMD appropriate location**
- **What is our value proposition for the application of IME? Precise 3D forming**

   **MADE IN GERMANY**

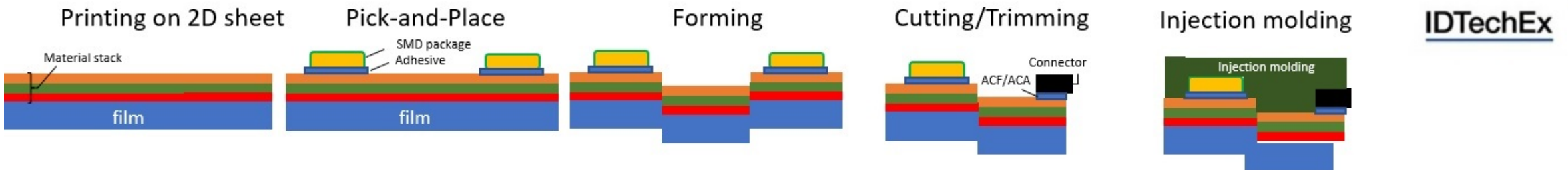
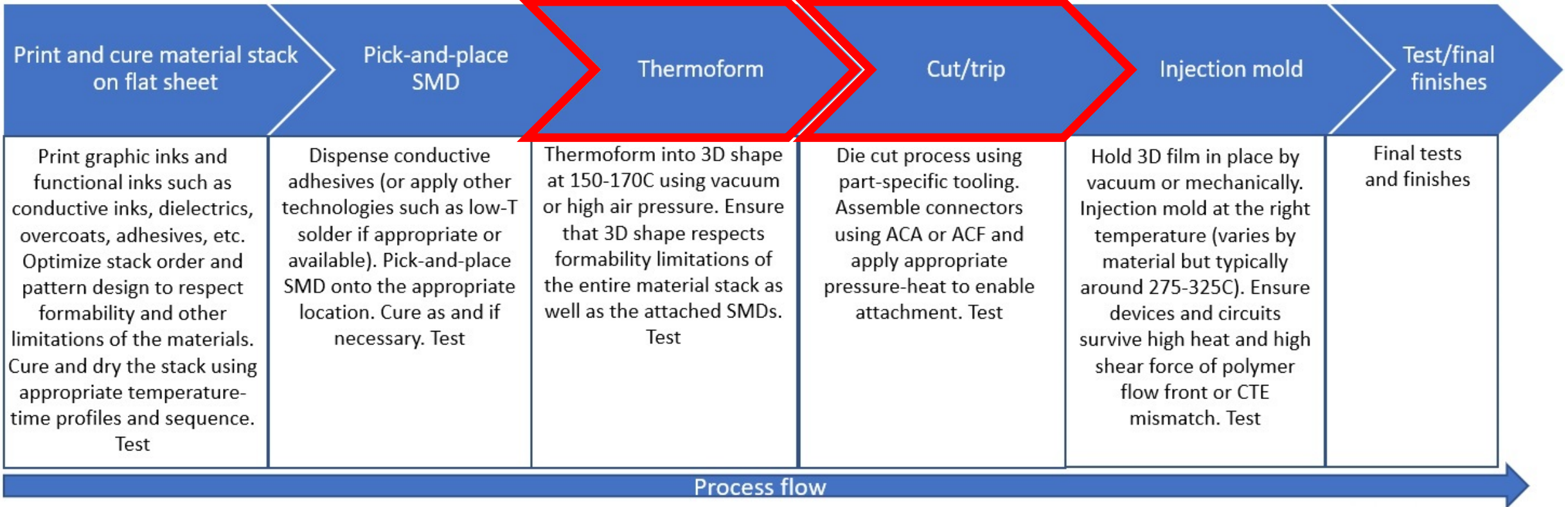


LESS DISTORTION

HIGH PRECISION

HIGH REPEATABILITY

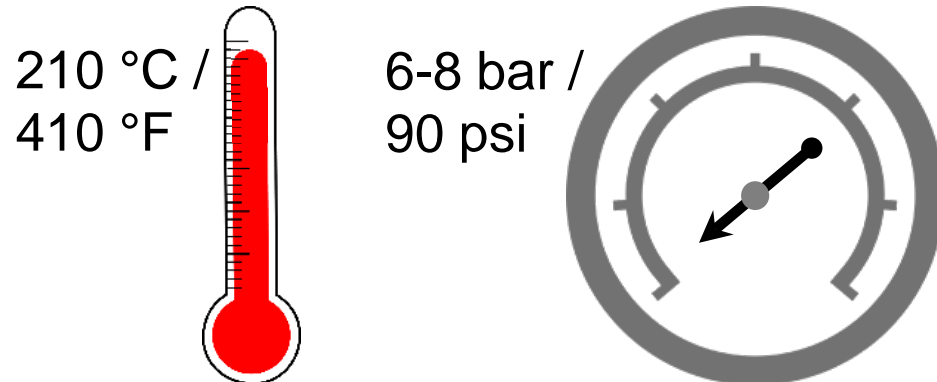
NIEBLING FORMTECHNOLOGIE | IME PROCESS STEPS*



VACUUM- / THERMOFORMING

- . Material is heated up to the melting temp.
- . Material becomes very soft
- . Vacuum & low pressure (6-8 bar / 90 psi)

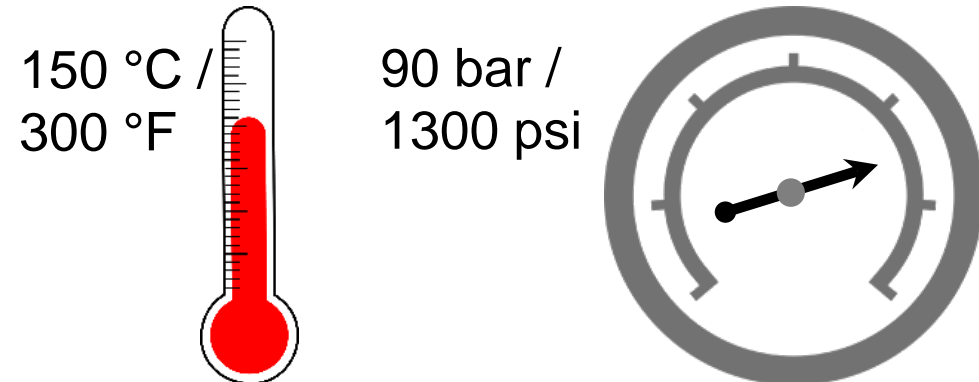
e.g. Polycarbonate (PC)



HIGH PRESSURE FORMING BY NIEBLING

- . Material is heated up to glass transition temp.
- . Material becomes formable (with stable core)
- . High pressure heated air (90 bar / 1300 psi)

e.g. Polycarbonate (PC)



VACUUM- / THERMOFORMING



- . Higher material distortion
- . Less precision / less repeatability
- . Evaporation of humidity (water spots)
- . Glue between laminates suffer
- . Printed (electronic circuit) inks/solvents suffer
- . Surface treatments suffer (e.g. hard coat)



HIGH PRESSURE FORMING BY NIEBLING



- . Low material distortion
- . High precision / high repeatability
- . No evaporation of humidity
- . Glue between laminates resists
- . Printed (electronic circuit) inks/binders resist
- . Surface treatments stay (e.g. hard coat)

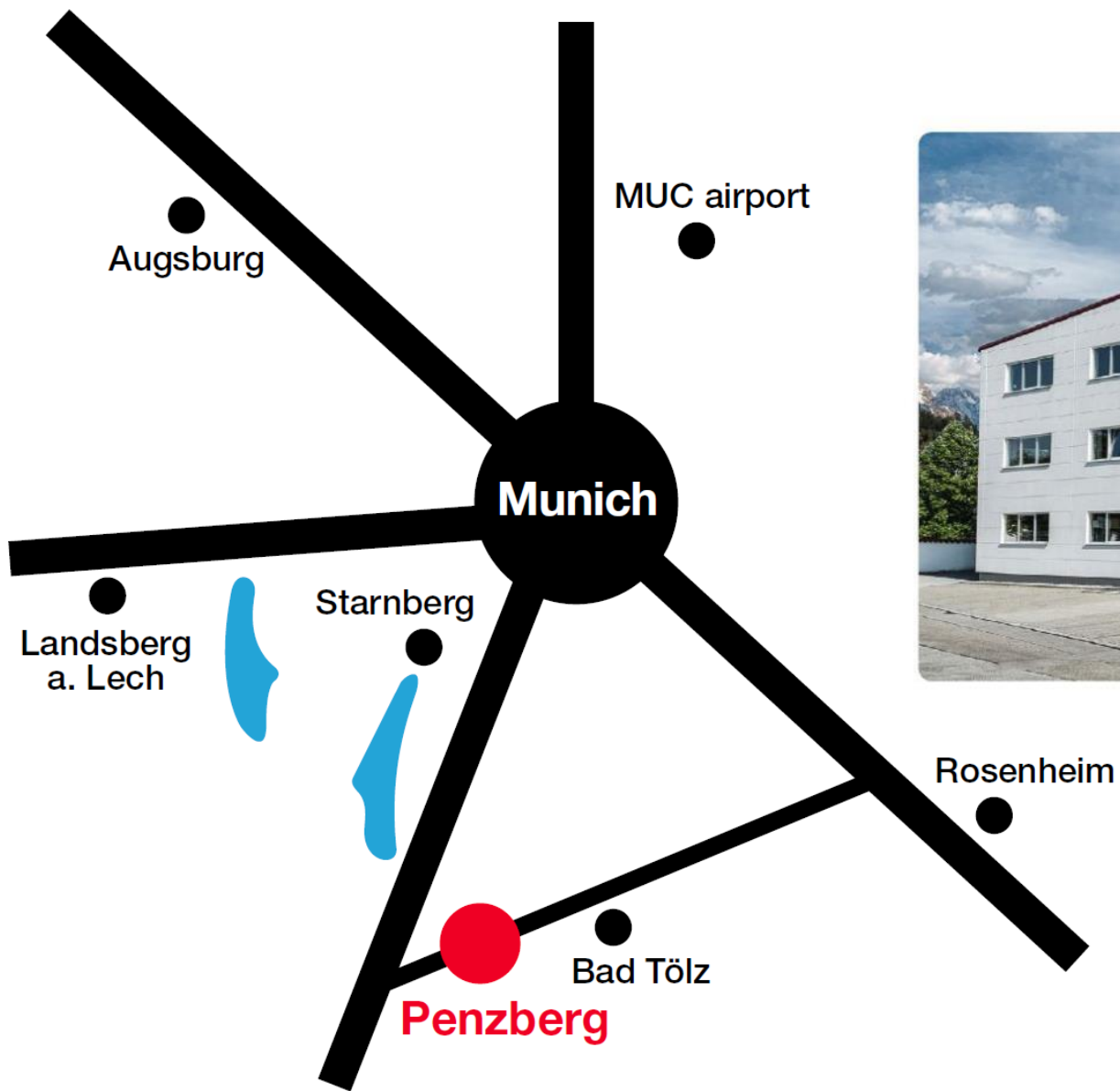


Niebling's YouTube channel



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